Claims

1.   A microarray for detecting the presence of one or more analytes in a sample, the microarray comprising:

a substrate defining a support surface;

a plurality of microspheres randomly distributed on the support surface, each microsphere comprising:

a solid support having an exterior surface;

a color-based address comprising one or more dyes contained within the solid support and adapted to identify an individual microsphere; and,

an analyte-binding entity attached to the exterior surface which binds one of said analytes.

2.   A microarray in accordance with claim 1, wherein the solid support comprises a member selected from the group consisting of polystyrene, nylon, and glass.

3.   A microarray in accordance with claim 1, wherein the one or more dyes comprises a plurality of dyes, each dye of the plurality of dyes capable of absorbing light at a wavelength distinct from wavelengths at which all other dyes in the plurality of dyes are capable of absorbing light.

4.   A microarray in accordance with claim 3, wherein the plurality of dyes comprises four dyes.

5.   A microarray in accordance with claim 1, further comprising a cover disposed on the substrate above the plurality of microspheres.

6.   A microarray in accordance with claim 1, wherein the plurality of microspheres includes a first microsphere distinguishable from at least a second microsphere based upon the color-based address.

7.   A microarray in accordance with claim 1, wherein the plurality of microspheres includes a first microsphere distinguishable from all other microspheres in the plurality of microspheres based upon the color-based address.

8.   A microarray in accordance with claim 1, wherein the support surface defines a plurality of wells.

9.   A microarray in accordance with claim 8, wherein each well in the plurality of wells is adapted to receive only a single microsphere from the plurality of microspheres.

10.   A microarray in accordance with claim 1, wherein the support surface defines a recess adapted to receive at least two microspheres of the plurality of microspheres.

11.   A microarray in accordance with claim 10, wherein the recess is adapted to receive all microspheres in the plurality of microspheres.

12.   A microarray in accordance with claim 1, wherein the support surface defines a channel.

13.   A microarray in accordance with claim 12, wherein the substrate has first and second edges and wherein the channel extends from the first edge to the second edge.

14.   A microarray in accordance with claim 13, wherein the channel extends from the first edge to the second edge along a non-linear path.

15.   A microarray in accordance with claim 12, wherein the channel has a width sufficient to accommodate only a single microsphere form the plurality of microspheres.

16.   A microarray in accordance with claim 12, wherein the channel includes channel walls, and wherein the channel walls have a height that is greater than the height of the microspheres.

17.   A microarray in accordance with claim 16, wherein the plurality of microspheres is disposed in the channel; and further comprising a cover disposed on the substrate above the plurality of microspheres.

18.   A microarray for detecting the presence of one or more analytes in a sample, the microarray comprising:

a plurality of microspheres randomly distributed on a support surface;

wherein each microsphere of the plurality of microspheres includes an analyte binding entity which binds one of said analytes and a color-based address.

19.   A microarray in accordance with claim 18, wherein the color-based address comprises a plurality of dyes, each dye of the plurality of dyes capable of absorbing light at a wavelength distinct from wavelengths at which all other dyes in the plurality of dyes are capable of absorbing light.

20.   A method of detecting one or more analytes in a sample, comprising:

providing a plurality of microspheres, each microsphere comprising a solid support having an exterior surface, a color-based address, and an analyte-binding entity attached to the exterior surface which binds one of said analytes;

exposing the plurality of microspheres to said sample;

randomly distributing the plurality of microspheres onto a substrate;

detecting indications of binding between said analytes and the analyte-binding entities on the plurality of microspheres;

associating each indication of binding with the location on the substrate of the analyte-binding entity to which said analyte has bound;

determining the color-based address of the microsphere at the location of each indication of binding; and

correlating each indication of binding with the color-based address based upon the location.

21.   A method of fabricating a microarray for detecting the presence of one or more analytes present in a sample, the method comprising:

providing a plurality of microspheres, each microsphere comprising a solid support having an exterior surface and a color-based address;

attaching an analyte-binding entity capable of binding one of said analytes to the exterior surface of at least one of the microspheres in the plurality of microspheres; and

randomly distributing the plurality of microspheres onto a substrate.